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(54) Title: HIGHLY ACIDIC METALATED ORGANIC ACID

(57) Abstract: A highly acidic metalated organic acid composition and its preparation. The acidic composition can be prepared by mixing a monovalent or polyvalent cation and an organic acid in the presence of a strong oxyacid, wherein the resultant acidic composition is less corrosive to a ferrous metal than a solution of a mineral acid having the same acidic pH value as that of the acidic composition, and where in the acid composition is more biocidal than a mixture of the organic acid and metal salt of the organic acid which the mixture has the same acid normality value as that of the acidic composition. The acidic composition can be prepared by mixing at least one regenerating acid, at least one metal base, and at least one organic acid, wherein the amount of the regenerating acid is in excess of the equivalent amount of the metal base.

What is claimed is:

1. An acidic composition having an acidic pH value and an acid normality value, the acidic composition comprising:
 - 5 a monovalent or polyvalent cation;
an organic acid; and
an anion of a strong oxyacid,
wherein the acidic composition is less corrosive to a ferrous metal than is a solution of a mineral acid having the same acidic pH value as that of
10 the acidic composition, and
wherein the acid composition is more biocidal than a mixture of the organic acid and a metal salt of the organic acid which mixture having the same acid
15 normality value as that of the acidic composition.
2. The acidic composition of claim 1, wherein the monovalent cation comprises an ion of Group IA element.
3. The acidic composition of claim 1, wherein
20 the polyvalent cation comprises an ion of a Group IIA element, but not beryllium.
4. The acidic composition of claim 1, wherein the polyvalent cation comprises an ion of a Group IIIA element, but not boron.
- 25 5. The acidic composition of claim 1, wherein the polyvalent cation comprises a metal of the first transition series.
6. The acidic composition of claim 1, wherein

the polyvalent cation comprises an ion of magnesium, calcium, ferrous, copper, or zinc.

7. The acidic composition of claim 1, wherein the polyvalent cation comprises an ion of lead,
5 bismuth, or tin.

8. The acidic composition of claim 1, wherein the organic acid comprises a carboxylic acid or an acidic vitamin.

9. The acidic composition of claim 8, wherein
10 the acidic vitamin comprises vitamin C.

10. The acidic composition of claim 1, wherein the organic acid comprises a monocarboxylic acid, a dicarboxylic acid, or a tricarboxylic acid.

11. The acidic composition of claim 1, wherein
15 the organic acid comprises acetic acid, lactic acid, formic acid, or propionic acid.

12. The acidic composition of claim 1, wherein the organic acid comprises an amino acid.

13. The acidic composition of claim 12, wherein
20 the organic acid comprises glycine, valine, leucine, phenylalanine, lysine, serine, asparagine, glutamic acid, alanine, arginine, aspartic acid, cysteine, histidine, hydroxylysine, hydroxyproline, isoleucine, methionine, proline, threonine, tryptophan, tyrosine,
25 aminoadipic acid, diaminobutyric, ornithine, pepicollic acid, sarcosine or triiodothyronine.